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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/932,578	08/17/2001	Blake Lewis	103.1072.01	5197

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EXAMINER

LE, MIRANDA

ART UNIT PAPER NUMBER

2167

DATE MAILED: 01/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/932,578	LEWIS ET AL.	
	Examiner	Art Unit	
	Miranda Le	2167	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 25-36 and 40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 25-36 and 40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>12/27/05</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/27/2005 has been entered.

Information Disclosure Statement

2. Applicants' Information Disclosure Statement, filed 07 December 2005, has been received, entered into the record, and considered. See attached form PTO-1449.

Claim Objections

3. Claims 25, 26, 29, 30, 32, 35, 36 are objected to because of the following informalities: a semi column is need after the word "including". Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless:

(e) the invention was described in

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(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 25-36, 40 are rejected under 35 U.S.C. 102(e) as being anticipated by Kusters et al. (US Patent No. 6,473,775).

Kusters anticipated independent claims 25, 32, 35, 36 by the following:

As per claim 25, Kusters teaches a method of operating a file system, said file system including an active map of information indicating in-use and free blocks (i.e. The free space bitmap file of the snapshot volume may be used to identify the free space at the time the snapshot was captured, abstract), said file system maintaining a set of snapshots (i.e. the operating system itself may request a snapshot, col. 5, lines 19-20), each snapshot including a representation of said file system as it was at an earlier time (i.e. any particular allocation unit on the base volume 215 may contain the same or different data when compared to the snapshot volume 311, which reflects the state of the base volume 215 at the earlier time, col. 6, lines 48-52), said method including:

computing a summary map (i.e. the snapshot volume 311, col. 6, line 30) in response to a logical union (i.e. logical combination, col. 6, line 31) of at least two copies (i.e. snapshot bitmap 270, col. 5, line 40) of earlier active maps included in at least two said snapshots (Figs. 2, 3, 4, col. 5, lines 7-59, col. 6, lines 5-65, col. 7, line 6 to col. 8, line 47).

As per claim 26, Kusters teaches making write allocation decision in response to said summary map (col. 7, line 6 to col. 8, line 47).

As per claim 27, Kusters teaches said summary map is computed using an inclusive OR operation (i.e. logical combination, col. 6, line 31) (col. 6, lines 5-65).

As per claim 28, Kusters teaches said set of snapshots includes at least two said snapshots (Figs. 2, 3, 4, col. 5, lines 7-59; and
said computing includes performing a bitwise logical operation on at least two said copies of earlier maps includes in said of snapshots (col. 6, lines 6-65).

As per claim 29, Kusters teaches making write allocation decision both in response to a current active map and in response to said summary map (col. 6, lines 6-65, col. 7, line 6 to col. 8, line 47).

As per claim 30, Kusters teaches computing a combination (i.e. logical combination, col. 6, line 31) (col. 6, lines 5-65) of a current active map and said summary map; and
making write allocation decisions in response to a result of said computing (col. 6, lines 6-65, col. 7, line 6 to col. 8, line 47, col. 9, line 31 to col. 10, line 47).

As per claim 31, Kusters teaches for a selected portion of said summary map

identifying a set of snapshots created since a recent update of said selected portion (col. 6, lines 6-65, col. 10, line 6- 60); and

updating said selected portion in response to only a most recent one of said snapshot (i.e. the snapshot driver 235 updates its listing of allocation units for which old data should be copied prior to being overwritten by clearing the entry associated with the data copied at block 608, col. 9, lines 21-24), (col. 8, line 48 to col. 9, line 30)

As per claim 32, Kusters teaches in a file system including an active map of information indicating in-use and free blocks (i.e. The free space bitmap file of the snapshot volume may be used to identify the free space at the time the snapshot was captured, abstract), said file system maintaining a set of snapshots (i.e. snapshot bitmap 270, col. 5, line 40), each snapshot including a representation of said file system as it was at an earlier time, said file system maintaining a summary map (i.e. the snapshot volume 311, col. 6, line 30) in response to at least one copy of an earlier active map included in at least one of said snapshots, a method of updating said summary map, said method including:

receiving a request to delete a selected snapshot (col. 9, lines 13 to col. 10, line 47); and
deleting said selected snapshot, wherein said deleting involves, for a block used by said selected snapshot (i.e. clearing the entry associated with the data copied at block 608, col. 9, lines 21-24), indicating said block is free in said summary map only in response to a snapshot just prior to said selected snapshot and in response to a snapshot just after said selected snapshot (col. 9, lines 13 to col. 10, line 47).

As per claim 33, Kusters teaches said indicating frees said block only when both said block is unused by said snapshot just prior to said selected snapshot (i.e. the snapshot driver 225 issues a request to the file system 225 to allocate free space on the base volume 215 that is also identified as free in the free space file 317 of the snapshot volume 311, col. 9, lines 61-64) (col. 8, line 48 to col. 9, line 30, col. 9, line 61 to col. 10, line 5); and

said block is unused by said snapshot just after said selected snapshot (i.e. the file system 225 may use the current free space file 317 to identify one or more potential locations in which to grow the differential file, e.g., potential free space 415 and potential free space 417 (as illustrated in FIG. 4). However, the snapshot driver 235, by comparing the allocations of those potential locations (416 and 418 respectively) on the snapshot volume 311 to the free space file 317 of the snapshot volume 311, recognizes that a portion of the potential free space 415 collides with space that was allocated when the snapshot was captured, col. 10, lines 6-15), (col. 8, line 48 to col. 9, line 30, col. 9, line 61 to col. 10, line 47).

As per claim 34, Kusters teaches said snapshot just after said selected snapshot corresponds to an active file system (i.e. the snapshot driver 225 issues a request to the file system 225 to allocate free space on the base volume 215 that is also identified as free in the free space file 317 of the snapshot volume 311. Accordingly, the file system 225 may compare free space information from the free space file 317 with free space in the current free space file 317' to identify acceptable locations in which to grow the differential file 319. For example, the snapshot driver 225 may pass the free space file 317 from the snapshot volume to the file system 225 which combines it with the current free space file 317 to determine space that is free in both

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(col. 9, line 61 to col. 10, line 5), (col. 8, line 48 to col. 9, line 30, col. 9, line 61 to col. 10, line 47).

As per claim 35, Kusters teaches in file system including an active map of information indicating in-use and free blocks (i.e. The free space bitmap file of the snapshot volume may be used to identify the free space at the time the snapshot was captured, abstract), said file system maintaining a set of snapshots, each snapshot including a representation of said file system as it was at an earlier time (i.e. any particular allocation unit on the base volume 215 may contain the same or different data when compared to the snapshot volume 311, which reflects the state of the base volume 215 at the earlier time, col. 6, lines 48-52), said file system maintaining a summary map computed in response to a logical union of at least two copies of an earlier active map included in at least two of said snapshots, a method of updating said summary map (i.e. the snapshot volume 311, col. 6, line 30), said method including:

selecting a set of blocks maintained by said file system for which to perform a write allocation operation (i.e. writer programs, such as writer program 207, may modify information stored on the base volume 215. The modifications may include writing new data to previously-unallocated space, col. 6, lines 39-42), (col. 5, line 60 to col. 6, line 65).

updating only a portion of said summary map corresponding to said set of blocks, in response to said selecting (i.e. At block 610, the snapshot driver 235 updates its listing of allocation units for which old data should be copied prior to being overwritten by clearing the entry associated with the data copied at block 608. In this manner, future writes to the allocation unit copied at block 608 will not be copied the same differential file. The process then proceeds

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to block 612, where the snapshot driver 235 allows the write operation to proceed by releasing the write request or passing the write request to a lower-level driver, such as the volume manager 22, col. 9, lines 21-29) (col. 9, line 13 to col. 10, line 47); and

performing said write allocation operation in response to said summary map (i.e. If a writer program reads from the snapshot volume 311, the information stored in the differential file 319 is applied by the snapshot driver 235 to the later base volume 215' to recreate the state of the base volume 215 at the earlier time, col. 6, lines 61-65), (col. 6, lines 6-65, col. 7, line 6 to col. 8, line 47, col. 9, line 31 to col. 10, line 47).

As per claim 36, Kusters teaches in a file system including an active map of information indicating in-use and free blocks (i.e. The free space bitmap file of the snapshot volume may be used to identify the free space at the time the snapshot was captured, abstract), and said file system maintaining a set of snapshots, each snapshot including a representation of said file system as it was at an earlier time (i.e. any particular allocation unit on the base volume 215 may contain the same or different data when compared to the snapshot volume 311, which reflects the state of the base volume 215 at the earlier time, col. 6, lines 48-52), said file system maintaining a summary map in response to at least one copy of an active map included in at least one of said snapshots, a method of updating said summary (i.e. the snapshot volume 311, col. 6, line 30), said method including:

while generating a consistency said point, selecting a set of blocks maintained by said file system and updating only a portion of said summary map corresponding to said set of blocks (i.e. At block 610, the snapshot driver 235 updates its listing of allocation units for which old data

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should be copied prior to being overwritten by clearing the entry associated with the data copied at block 608. In this manner, future writes to the allocation unit copied at block 608 will not be copied the same differential file. The process then proceeds to block 612, where the snapshot driver 235 allows the write operation to proceed by releasing the write request or passing the write request to a lower-level driver, such as the volume manager 22, col. 9, lines 21-29), (col. 9, line 13 to col. 10, line 47).

As per claim 40, Kusters teaches said summary map is computed using inclusive OR operation (i.e. logical combination, col. 6, line 31), (col. 6, lines 5-65).

Response to Arguments

6. Applicant's arguments regarding Sekido is not seen by Applicant to discloses the features of amended claims 25-36, 40 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Miranda Le whose telephone number is (571) 272-4112. The examiner can normally be reached on Monday through Friday from 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jean Homere, Esq., can be reached on (571) 272-3780. The fax number to this Art Unit is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-3900.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Miranda Le
January 20, 2006



MOHAMMAD ALI
PRIMARY EXAMINER